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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SIM, YONG H

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,227	Applicant(s) FURUKAWA ET AL.	
	Examiner YONG SIM	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) 1-42, 45, 47-55 and 57-60 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 43, 44, 46 and 56 is/are allowed.
- 6) ☒ Claim(s) 61-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 61 – 64 and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyata et al. (Hereinafter “Miyata” US 2002/0033789 A1).**

Re claim 61, Miyata teaches a liquid crystal display device which includes a liquid crystal panel and a drive circuit (See Fig. 1), wherein: the drive circuit stores as a Look-up Table an optimum level of a test signal consisting of either only an overshoot signal (Para 0090; “The tone data stored in the form of the look-up table in the LUT memory.” Para 0097; “The response can be improved with correction since in this case the influence of capacitance change of the liquid crystal cell can be suppressed.” See Fig. 6, the overshoot voltage is applied as a correction to obtain correction tone within one frame.) or both an overshoot signal and an undershoot signal in accordance with tone transition from an original tone to an attainment tone; and

the optimum level of the test signal is obtained by an evaluation method that has the steps of repeatedly supplying to the liquid crystal panel, (i) a signal corresponding to an original tone, (ii) the test signal, and (iii) a signal corresponding to an attainment tone sequentially in this order while sweeping a level of the test signal, wherein the level of

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the test signal at each trial of the sweeping is selected and tested in turn from a plurality of predetermined levels and without calculation of an ideal optimum level of the test signal, so as to analyze display results of the liquid crystal panel; and in accordance with analysis results, determining the optimum level of the test signal in association with the original tone and the attainment tone (Para 0090; “the tone data stored in the LUT are decided from the result of Equation (4), taking into consideration such factors as response of the liquid crystal cell between tones (between tone construe the deference between the original tone and the attainment tone. The correction tone data refers to the test signal.), and a load capacitance of a pixel. **Alternatively**, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel.” In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction, which is done without calculation.).

Re claim 62, Miyata teaches the crystal display device as set forth in claim 61, wherein the level of the test signal at each trial of sweeping is selected and tested in turn from a plurality of predetermined levels without calculation of a predicted value of an ideal optimum level of the test signal based on the original tone or the attainment tone, and regardless of the predicted value (Para 0090; “**Alternatively**, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel.” In order to attain the correction tones by visual inspection, the user must

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repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction, which is done without calculation. See Fig. 6.).

Re claim 63, Miyata teaches the liquid crystal display device as set forth in claim 62, wherein the level of the test signal at each trial of the sweeping is selected and tested in turn from the plurality of predetermined levels which satisfy a rule that the level is equal to or more than a level which corresponds to the attainment tone in case of overshoot and is equal to or less than a level which corresponds to the attainment tone in case of undershoot tone (See Fig. 6. The attainment is substantially displayed fastest within one frame without exceeding the attainment tone. The figure clearly shows that the correction curve is faster than without the correction.).

Re claim 64, Miyata teaches the liquid crystal display device as set forth in claim 61, wherein: the drive circuit stores as a Look-up Table an optimum combination of a plurality of levels of the overshoot signal in predetermined tone transition; and the optimum combination is set to a combination of levels of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and then the overshoot test signal having a plurality of levels while sweeping the levels of the overshoot test signal, so as to analyze the display results of the liquid crystal panel (Para 0090; “**Alternatively**, the defined tone data may be decided by visually inspecting

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the actual response of tones on the liquid crystal panel.” In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction, which is done without calculation. See Fig. 6.).

Re claim 66, Miyata teaches the liquid crystal display device as set forth in claim 61, wherein the optimum level is set to a level of the test signal that corresponds to an optimum one of display results (Para 0090; “**Alternatively**, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel.” In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction, which is done without calculation. See Fig. 6.).

3. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata in view Usui et al. (Hereinafter “Usui” US 5,347,294).

Re Claim 67, Miyata teaches the liquid crystal display device as set forth in claim 61.

But does not expressly disclose wherein the Look-up Table is stored with respect to each of a plurality of temperatures.

However, Usui teaches an image display circuit comprising a table ROM with data of generated gray scale data greater (overshoot) than the gray scale of the current video signal (Usui: Col. 1, lines 45 – 60) and a plurality of ROM Tables provided in association with different temperature (Usui: Col. 6, lines 15 - 18.).

Therefore, taking the combined teachings of Miyata and Usui, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of having a plurality of ROM tables provided in association with different temperature as taught by Usui into the liquid crystal display device as taught by Miyata to obtain a liquid crystal display device comprising look-up tables comprising optimized overshoot signals wherein the plurality of look-up tables are provided in association with different temperatures to accomplish a high response speed and an image of high quality in conditions where temperature may vary.

4. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyata in view of Shimada et al. (Hereinafter “Shimada” US 5,801,673).

Re claim 65, Miyata teach the liquid crystal display device as set forth in claim 61, wherein: the drive circuit stores as a Look-up Table an optimum level of the overshoot signal in predetermined tone transition; and the optimum combination is set to a level of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original ton, and the overshoot test signal sequentially in this order

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while sweeping the levels overshoot test signals, so as to analyze the display results of the liquid crystal panel (Para 0090; “**Alternatively**, the defined tone data may be decided by visually inspecting the actual response of tones on the liquid crystal panel.” In order to attain the correction tones by visual inspection, the user must repeatedly inspect and analyze the original, and attainment tones by varying/sweeping the test signal to obtain the optimal value of the correction, which is done without calculation. See Fig. 6.).

But does not expressly describe an undershoot signal.

However, Shimada teaches a liquid crystal display device wherein an overshoot and an undershoot are added by the data signal generating circuit to portions of a waveform of a data signal (Shimada: Col. 13, lines 50 - 56.).

Therefore, taking the combined teachings of Miyata and Shimada, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of including an overshoot and an undershoot to the data signal waveforms as taught by Shimada into the liquid crystal display device as taught by Miyata to obtain a liquid crystal display device comprising a drive circuit that stores Look-up Table an optimum combination of a level of an undershoot and overshoot signals in predetermined tone transition to suppress the decrease in resolution and obtain a display with high quality (Shimada: Col. 13, lines 55 – 60).

Allowable Subject Matter

5. Claim 68 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. Claim 56 - 57, 43, 44 and 46 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter:

Miyata et al. (US 2002/0033789 A1) teaches a liquid crystal display device carrying out tone display with pixels by applying a tone voltage according to tone data to each pixel in each frame, and includes: an LUT memory, which receives tone data of a display frame and tone data of an immediately preceding frame, for converting and outputting the tone data of the display frame.

Usui et al. (US 5,347,294) teaches an image display circuit comprising a table ROM with data of generated gray scale data greater (overshoot) than the gray scale of the current video signal (Usui: Col. 1, lines 45 – 60) and a plurality of ROM Tables provided in association with different temperature (Usui: Col. 6, lines 15 - 18.).

Shimada et al. (US 5,801,673) teaches a liquid crystal display device wherein an overshoot and an undershoot are added by the data signal

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generating circuit to portions of a waveform of a data signal (Shimada: Col. 13, lines 50 - 56.).

However, none of the prior art of record teaches the newly added limitation “wherein the optimum one of the display results is a display result of the display results where the attainment tone is substantially displayed faster than a remainder of the display results without exceeding the attainment tone.” In other words, none of the prior art of record teaches the specific steps of obtaining a plurality of tested attainment tone to select an optimum attainment tone which is faster than the rest or remaining tested attainment tone results.

Therefore, the claims indicated to be allowable.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG SIM whose telephone number is (571)270-1189. The examiner can normally be reached on Monday - Friday (Alternate Fridays off) 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YONG SIM/
Examiner, Art Unit 2629

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629

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